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Three new species and three new records of *Xenapates* from Togo (Hymenoptera: Symphyta: Tenthredinidae)

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ABSTRACT

During faunistic surveys conducted at Mt Kloto in western Togo in 2001, a total of 61 specimens of the sawfly genus *Xenapates* Kirby, 1882, were collected. The material contained seven species, of which three are described as new: *Xenapates atratus* sp. n., *X. goergeni* sp. n., and *X. togoensis* sp. n. In addition, *Xenapates braunsi* (Konow, 1896), *X. gabunensis* (Konow, 1896), and *X. weulersseae* Koch, 1995 are reported for the first time from Togo. The genitalia of the new species are illustrated and their affinities are discussed. A map showing their current known distribution is included.

KEY WORDS: Hymenoptera, Symphyta, Tenthredinidae, *Xenapates*, sawflies, new species, Afrotropical Region, Togo.

INTRODUCTION

To date, the Afrotropical genus *Xenapates* encompasses 39 valid species. In the last revision (Koch 1995), which was originally based on 23 taxa, only 17 species were recognised as valid, and 19 new species were described. More recently, three additional species were described (Koch 1996, 1998).

The material at the International Institute of Tropical Agriculture, Cotonou, Republic of Benin, is unique for western Africa both in number of species and specimens. This collection is representative of the species richness of Togo and Benin, and therefore provides fundamental information about the diversity of sawflies, their distribution, habitat preference, and morphological variability in this under-researched region. By contrast, the collections of large museums in Europe and the United States contain very little material of Symphyta from West Africa, and are mostly limited to single specimens. Furthermore, little or nothing is known about the host plants, larval stages, and phenology of species from the Afrotropical Region (Chevin 1985; Koch 2003, 2007). Among other factors, the poor knowledge of Afrotropical sawflies can be explained by the fact that no collections specifically targeting sawflies, except those by the author, have previously been undertaken in Africa.

CHARACTERISTICS OF THE TYPE LOCALITY

Mt Kloto (6°57'00"N:0°34'00"E) with an altitude of 741 m lies a few kilometres south of Misahoehe and about 20 km west of Mt Agou (984 m) in the vicinity of the western Togo border with Ghana (Fig. 1). The area of Mt Kloto (also spelled Klouto) is one of the highest elevations in Togo. Misahoehe is traditionally an entomological locality, with a considerable number of types of most insect orders deposited in the collections of Museum für Naturkunde, Humboldt-Universität, Germany.

The annual rainfall averages more than 1500 mm and is the highest in Togo. In many cases, extensive plantations of coffee and cacao have destroyed the original large tracts of primary forests with their floristic richness. A typical moist savannah flora has gradually established on agriculturally unused land.

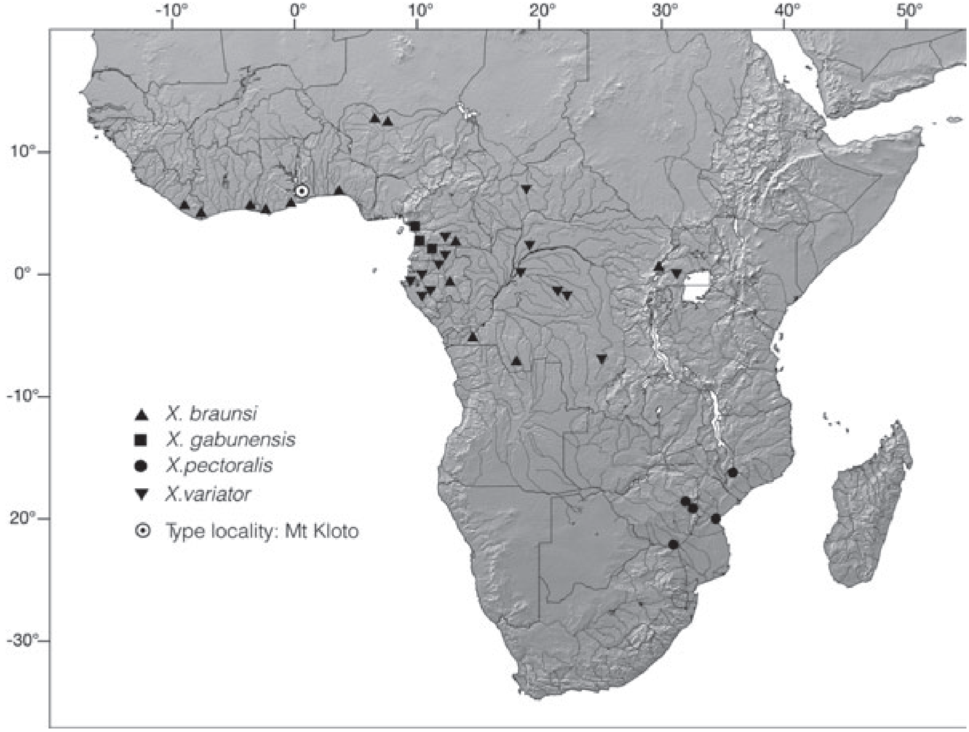


Fig. 1. Distribution of *Xenapates* species that are relevant to the differential diagnosis of the new species.

MATERIAL AND METHODS

The descriptions are based on 61 specimens of the genus *Xenapates* that are deposited in the arthropod reference collection at the International Institute of Tropical Agriculture, Cotonou, Republic of Benin. This material was collected by G. Goergen from the above institute in October 2001, using a sweep-net.

Specimens are held in the following institutions: International Institute of Tropical Agriculture, Cotonou, Republic of Benin (IITAC); Museum für Naturkunde, Humboldt-Universität, Berlin, Germany (MNHU); Natal Museum, Pietermaritzburg, South Africa (NMSA).

The following abbreviations are used in the text: HT – holotype, OOL – ocular ocellar line, POL – posterior ocellar line (postocellar line).

TAXONOMY

Genus *Xenapates* Kirby, 1882

Xenapates: Kirby 1882: 180.

Type species: *Dineura* (?) *africana* Cameron, 1876: 470, by monotypy.

The genus *Xenapates* is characterised by a deeply emarginated clypeus with two strong lateral lobes, an asymmetric labrum, and asymmetric mandibles with a very large basal tooth on the left mandible (Koch 1995, fig. 1a). The tarsal claw has a basal lobe, sometimes with a small notch but no subapical tooth (Koch 1995, fig. 1g).

Xenapates atratus sp. n.

Figs 2, 11

Etymology: From the Latin *atratus*, black, referring to the black body colour.

Description:

Female.

Head black; distal flagellomeres of antenna dirty whitish ventrally, mandible light brown with whitish basal half; clypeus whitish; labrum whitish with a light brown median spot at base. Thorax black with following white: posterior margin and lateral markings of pronotum, extreme outer lateral marking of tegula, postspiracular sclerite, two large lateral spots on mesoscutellum, mesoscutellar appendage, metascutellum, and a spot on mesopleuron. Legs white with following blackish: lateral surface at base of coxa$_3$, anterior and posterior surface of femur$_1$, apical two-thirds of anterior and posterior surface of femur$_2$, apical third of femur$_3$, inner part of tibiae$_{1/2}$, inner part of apex of tibia$_3$, more or less all tarsi. Wings bicoloured, with apical half conspicuously infuscate and basal half hyaline; costa, subcosta, stigma and rest of venation brown. Abdomen black, terga and sterna with narrow white posterior margin.

Head from above slightly narrowed behind eyes. Antenna 1.7× as long as maximum head width. POL:OOL=1.0:2.3–2.9 (2.7 HT). Postocellar area: width:length = 1.0:1.1–1.3 (1.3 HT); lateral furrows slightly convex. Frontal area with obtuse anterior crossridge, medially not interrupted; lateral furrows convex, ending scrobiculate at small lateral tubercles; interantennal groove shallowly, slightly transversally curved. Vertex, frons and gena nearly impunctate, strongly shining. Base of mandible moderately punctate. Pubescence on vertex white, about as long as diameter of a lateral ocellus. Thorax nearly impunctate, strongly shining. Abdomen without microsculpture, strongly shining.

Serrulae 9–11 as in Fig. 2.

Length: 6.3–9.2 mm.

Male. Unknown.

Holotype: ♀ "TOGO: Kloto, forest area, Oct. 2001, leg.: G. Goergen"; [red] "Holotypus, *Xenapates atratus* sp. n., det.: F. Koch" (MNHU).

Paratypes: 3♀ same data as holotype (MNHU, IITAC).

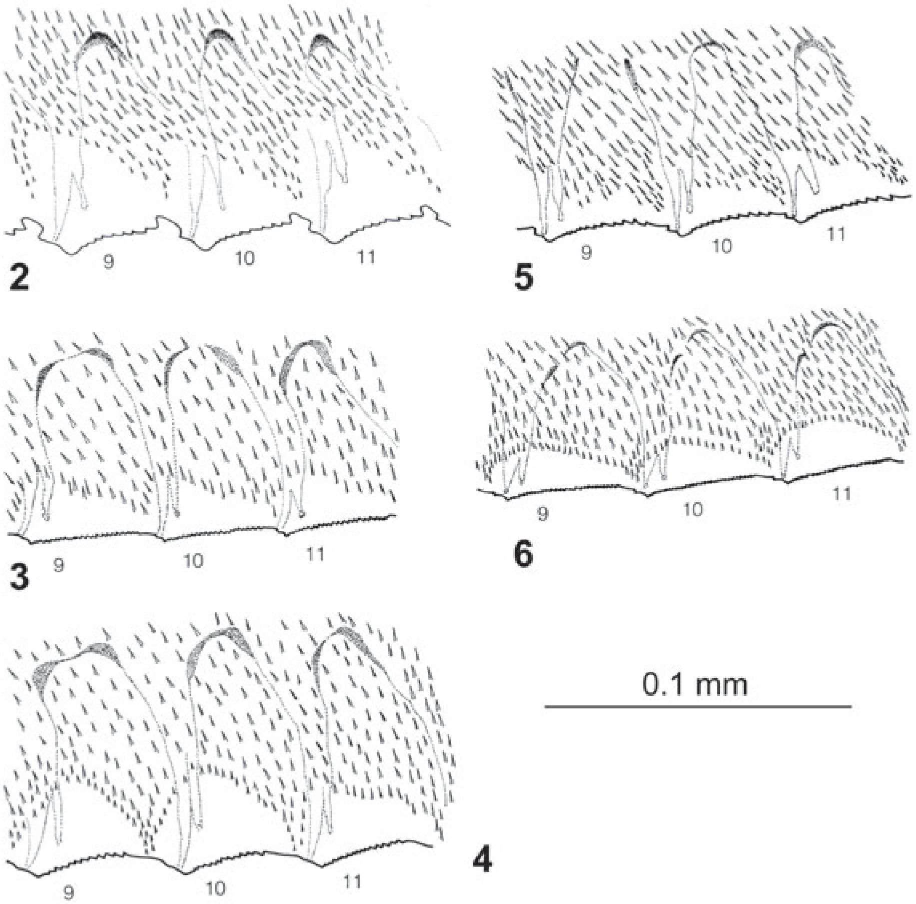
Host plant: Unknown.

Distribution: Togo (Fig. 1).

Remarks: In Koch's (1995) key to species of *Xenapates*, *X. atratus* leads to *X. braunsi* and *X. gabunensis* (couplet 50). The distribution ranges of *X. atratus* and *X. braunsi* overlap (Fig. 1).

The new species, however, differs from *X. braunsi* in the shape of the serrulae (Figs 2, 3). In addition, the white spot of the mesoscutellum of *X. atratus* is divided into two large lateral spots, whereas in *X. braunsi* the whitish spot is located at the posterior margin of the mesoscutellum, and the basal halves of *X. braunsi* wings are subhyaline. The lateral tubercles of the crossridge of *X. braunsi* are also more distinctly developed than in *X. atratus*.

The differentiation from *X. gabunensis* is based only on the shape of the serrulae (Fig. 4). The females of *X. gabunensis* (males are also unknown) may be distinguished



Figs 2–6. Serrulae 9–11 of *Xenapates* species: (2) *X. atratus* sp. n., (3) *X. braunsi* (Konow), (4) *X. gabunensis* (Konow), (5) *X. goergeni* sp. n., (6) *X. pectoralis* Forsius.

by the dirty whitish tegulae and the whitish spot on the mesoscutellum, which is conspicuously smaller and located at the posterior margin of the mesoscutellum.

The variability of *X. atratus* is apparent in the outline of the white spot of the mesoscutellum, which may be indistinctly separated into two lateral spots. Sometimes a brownish median line on the mesoscutellar appendage is visible.

Xenapates goergeni sp. n.

Figs 5, 12

Etymology: This species is named after Dr Georg Goergen, head of the Biodiversity Centre (IITAC).

Description:

Female.

Head black; mandible reddish brown with pale yellow basal half; clypeus and labrum pale yellow. Thorax black with following pale yellow: ventrolateral markings of pronotum, postspiracular sclerite, mesosternum and ventral part of mesopleuron, anterior margin of mesepimeron; mesopleuron between blackish dorsal and pale yellow ventral part with a very inconspicuously whitish longitudinal strip. Legs yellow; coxae whitish, distal tarsomeres brown. Wings uniformly infuscate; costa, subcosta, stigma and rest of venation brownish black. Abdomen yellow; sawsheath black, valvifer$_2$ yellow.

Head from above slightly narrowed behind eyes. Antenna 1.7× as long as maximum head width. POL:OOL=1.0:1.8–1.9 (1.8 HT). Postocellar area: width:length = 1.0:1.4; lateral furrows conspicuously convex. Frontal area with very obtuse anterior crossridge, medially interrupted; lateral furrows convex, ending scrobiculate at anterior crossridge, lateral tubercles inconspicuously developed; interantennal groove very shallow, crescent-shaped. Vertex, frons and gena impunctate, strongly shining. Base of mandible scarcely sculptured, moderately shining. Pubescence on vertex brown, about as long as diameter of a lateral ocellus. Thorax nearly impunctate, strongly shining. Abdomen without micro-sculpture, strongly shining.

Serrulae 9–11 as in Fig. 5.

Length: 7.8–8.0 mm.

Male. Unknown.

Holotype: ♀ “TOGO: Kloto, forest area, Oct. 2001, leg.: G. Goergen”; [red] “Holotypus, *Xenapates goergeni* sp. n., det.: F. Koch” (MNHU).

Paratype: 1♀ same data as holotype (IITAC).

Host plant: Unknown.

Distribution: Togo (Fig. 1).

Remarks: In the *Xenapates* key by Koch (1995), the new species is similar to *X. pectoralis* Forsius, 1927. The anterior crossridge of the frontal area of *X. pectoralis*, however, is not medially interrupted, and the wings are very slightly bicoloured with a more infuscate apical and a paler basal half. Additionally, *X. goergeni* differs in the very indistinct or not visible whitish longitudinal strip on the mesopleuron. This character is, however, also variable in *X. pectoralis*, from mostly conspicuously white to rarely indistinctly visible. For accurate identification it is therefore essential to examine the shapes of the serrulae, which are distinctly different (Figs 5, 6). Furthermore, *X. pectoralis* is distributed in south-eastern Africa (Fig. 1).

It is very difficult to describe the variability of the new species based on only two specimens. Nevertheless, the distal flagellomeres of the paratype are dirty whitish ventrally, the metascutellum is yellow laterally, and the crossridge of the frontal area is more conspicuously interrupted.

Xenapates togoensis sp. n.

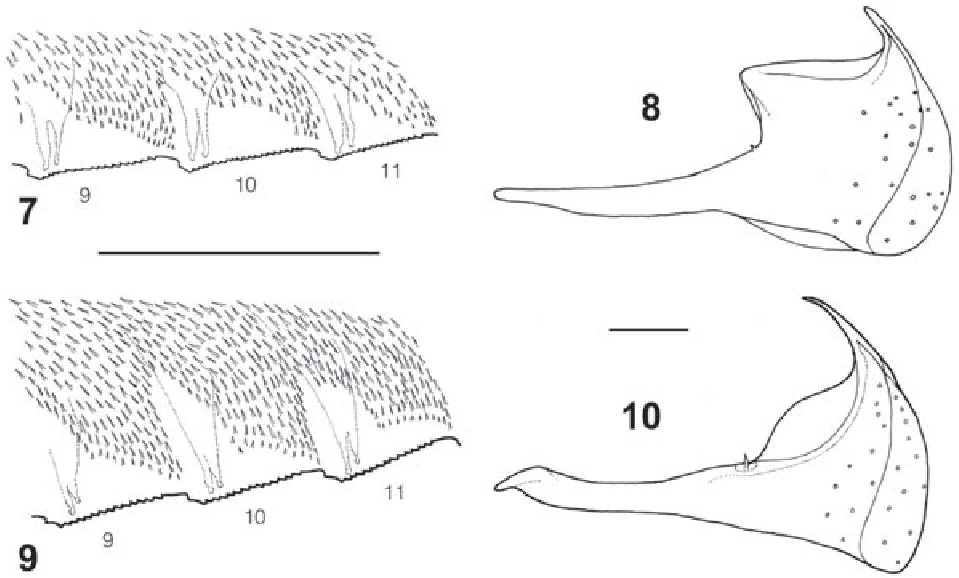
Figs 7, 8, 13

Etymology: This species is named after Togo, its country of origin.

Description:

Female.

Head black with following yellow: fascial orbit, gena entirely nearly to top of compound eye, supraclypeal area, clypeus, labrum and mandible without brown apex; antenna



Figs 7–10. (7, 8) *Xenapates togoensis* sp. n.: (7) serrulae 9–11, (8) penis valve (left, lateral aspect); (9, 10) *Xenapates variator* Enslin: (9) serrulae 9–11, (10) penis valve (left, lateral aspect). Scale bars = 0.1 mm.

black, outer part of scape and pedicel yellow, distal flagellomeres light brown ventrally. Thorax yellow; pronotum medially brown, mesonotum black, lateral margin of median mesoscutal lobe and mesoscutellar appendage yellow. Legs yellow; coxae whitish, distal tarsomeres brown. Wings slightly infuscate, at base narrowly somewhat darker; costa, subcosta, stigma, and rest of venation brownish black. Abdomen yellow; tergum$_1$ with two blackish medial spots, terga$_{6-8}$ blackish medially, sawsheath black, valvifer$_2$ yellow.

Head from above slightly narrowed behind eyes. Antenna 2.0× as long as maximum head width. POL:OOL=1.0:2.5–2.9 (2.7 HT). Postocellar area: width:length = 1.0:1.1 –1.2 (1.1 HT); lateral furrows convex, and divergent towards posterior margin of head. Frontal area slightly convex anterior cross-ridge indistinct, conspicuously interrupted medially; lateral furrows very slightly convex, and with supraantennal furrows connected; interantennal groove triangular, shallow. Vertex, frons and gena impunctate, strongly shining. Base of mandible with shallow, irregular punctation, shining. Pubescence on vertex brown, about as long as diameter of a lateral ocellus. Thorax nearly impunctate, strongly shining. Abdomen indistinctly microsculptured, shining.

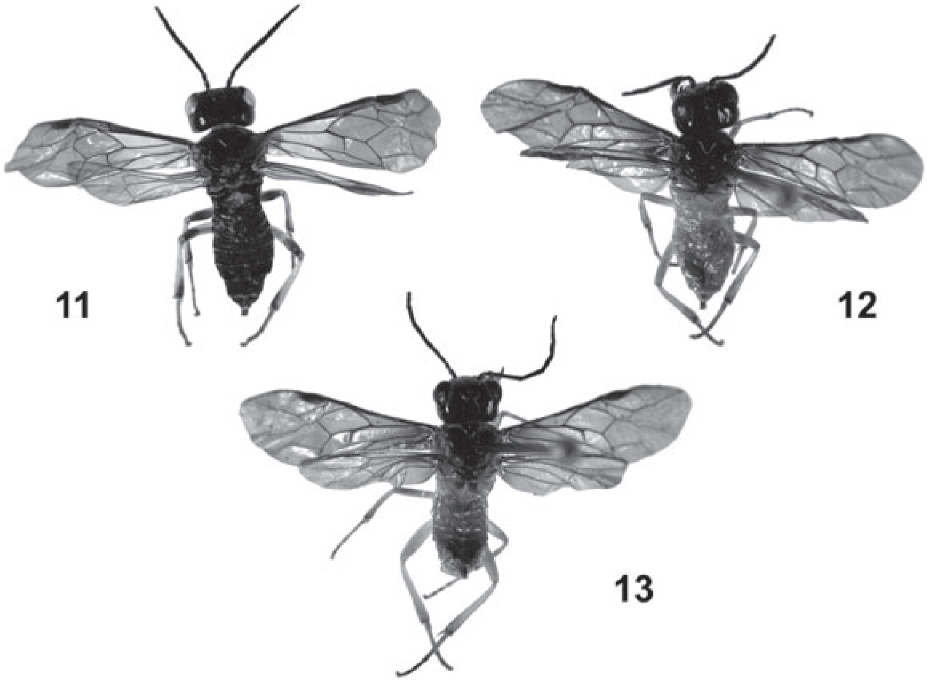
Serrulae 9–11 as in Fig. 7.

Length: 7.5–8.7 mm.

Male.

Coloration similar to that of female, except dorsal half of gena black; pronotum, tegula, anterior margin of mesopleuron and anepimeron blackish, mesonotum entirely black; apex of tibia$_3$ very narrowly brown.

Head narrower behind eyes than in female. Antenna 1.8× as long as maximum head width. POL:OOL=1.0:2.9–3.2. Postocellar area: width:length = 1.0:1.1.



Figs 11–13. (11) *Xenapates atratus* sp. n., (12) *X. goergeni* sp. n., (13) *X. togoensis* sp. n.

Penis valve as in Fig. 8.

Length: 5.8–6.2 mm.

Holotype: ♀ "TOGO: Kloto, forest area, Oct. 2001, leg.: G. Goergen"; [red] "Holotypus, *Xenapates togoensis* sp. n., det.: F. Koch" (MNHU).

Paratypes: 6♂19♀ same data as holotype (IITAC, MNHU, NMSA).

Host plant: Unknown.

Distribution: Togo (Fig. 1).

Remarks: On the basis of the junction between the lateral furrows of the frontal area with the supraantennal furrows and the shape of the penis valve (Fig. 8), *X. togoensis* belongs—with *X. aequatorialis* Koch, 1995, *X. dorsalis* Koch, 1998, *X. gaullei* (Konow, 1896), and *X. variator* Enslin, 1913—to the *X. variator* group (Koch 1995).

According to colour patterns, *X. togoensis* and *X. variator* are very similarly marked. An aggravating factor is the large variability in the colouration of *X. variator* (Koch 1995). It is therefore absolutely essential to examine the genitalia carefully. Differentiation of males, based on the shape of the penis valves (Figs 8, 10), is clearly easier than that of females. In *X. variator*, the denticles of the serrulae are more strongly developed than in *X. togoensis* (Figs 7, 9). Furthermore, according to Koch (1995), the ranges of both species seem to be separated (Fig. 1); it has, however, not been absolutely ascertained that the ranges do not overlap.

The colour variability of the new species is similarly developed as in *X. variator*. The gena of females is sometimes yellow only in the ventral half, and the blackish markings on the abdomen may be more extended. In males, the yellow part of the gena may be somewhat reduced, whereas the tergum$_1$ is sometimes entirely yellow.

ADDITIONAL *XENAPATES* SPECIES FROM MT KLOTO

Xenapates braunsi (Konow, 1896)

Fig. 3

Taxonus braunsi: Konow 1896: 314. (Type locality: Ibadan, Nigeria)
Siobla braunsi: Konow 1908: 162.
Xenapates braunsi: Enslin 1913: 309; Koch 1995: 384, figs 9a–d.

Material examined: 1♀ TOGO: Kloto, forest area, Oct. 2001, G. Goergen (IITAC).

Distribution (Koch 1995): Cameroon, Democratic Republic of the Congo, Gabon, Ghana, Ivory Coast, Liberia, Nigeria. First record for Togo (Fig. 1).

Xenapates gabunensis (Konow, 1896)

Fig. 4

Taxonus gabunensis: Konow 1896: 315. (Type locality: Gabun [Gabon])
Siobla gabunensis: Konow 1908: 162.
Xenapates gabunensis: Enslin 1913: 309; Koch 1995: 397, fig. 19.

Material examined: 5♀ TOGO: Kloto, forest area, Oct. 2001, G. Goergen (IITAC).

Distribution (Koch 1995): Cameroon, Equatorial Guinea, Gabon. First record for Togo (Fig. 1).

Xenapates gaullei (Konow, 1896)

Taxonus gaullei: Konow 1896: 314. (Type locality: Senegal)
Anataxates gaullei: Benson 1939: 123.
Xenapates gaullei: Koch 1995: 398, figs 20a, b.

Material examined: 6♂6♀ TOGO: Kloto, forest area, Oct. 2001, G. Goergen (IITAC).

Distribution (Koch 1995): Benin, Cameroon, Democratic Republic of the Congo, Equatorial Guinea, Ghana, Ivory Coast, Nigeria, Senegal, Sierra Leone, Togo, Uganda (Fig. 1).

Xenapates weulersseae Koch, 1995

Xenapates weulersseae: Koch 1995: 421, figs 38a, b. (Type locality: Uamgebiet, Bosum [Central African Republic])

Material examined: 9♂1♀ TOGO: Kloto, forest area, Oct. 2001, G. Goergen (IITAC).

Distribution (Koch 1995): Central African Republic, Democratic Republic of the Congo, Ghana, Ivory Coast, Nigeria, Uganda. First record for Togo (Fig.1).

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